

ABSTRACT

A multi-layer coating for a transparent substrate, such as glass, plastic, or other transparent material, which increases the durability and weatherability of the substrate. The coating includes a surface-hardening layer of organo-siloxane formed over the substrate. An abrasion-resistant coating comprising a multi-layer stack of alternating layers of silicon dioxide and zirconium dioxide is formed over the surface-hardening layer. The multi-layer coating further includes a hydrophobic outer layer of perfluoroalkylsilane formed over the abrasion-resistant coating to form an outer moisture-resistant surface. This multi-layer coating configuration increases the abrasion resistance and mechanical strength of the transparent substrate on which it is formed without imparting color to the transparent substrate.